Assignment Letter/Surat Tugas

No. AL/FEIT/087A/III/22
Date March 15, 2022
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Doc. Type Main Document / *Dokumen Utama*

Dena Hendriana, B.Sc., S.M., Sc.D

Activity Assignment | ***Penugasan Kegiatan***

Dean of the Faculty of Engineering and Information Technology

Dekan Fakultas Teknik dan Teknologi Informasi

In consideration of:

His appointment as the Dean of the Faculty of Engineering and Information Technology under agreement no. SK/017/Y-SGU/VIII/2018

Mengingat:

Pengangkatannya sebagai Dekan Fakultas Teknik dan Teknologi Informasi di bawah perjanjian no. SK/017/Y-SGU/VIII/2018

Herewith permits to | ***Dengan ini menugaskan kepada***

Name/*Nama:* Dena Hendriana, B.Sc., S.M., Sc.D

Position/*Jabatan:* Head of Master of Mechanical Engineering Department/ Kepala Program Studi Magister Teknik Mesin

Faculty/*Fakultas*: Engineering and Information Technology/ Teknik dan Teknologi Informasi.

To become a trainer on the following activity below: | *Untuk menjadi pelatih pada kegiatan berikut dibawah ini:*

No	Activity / *Kegiatan*	Organizer / *Penyelenggara*	Day & Date / *Hari & Tanggal*	Venue / Tempat
1.	European Energy Management (EUREM) training 2022	SGU – EKONID	March 18th 2022 until June 25th 2022	SGU Campus

The Appointed shall accomplish the task in responsible ways in line with the related guidelines and other regulation given by SGU.

Pihak yang bersangkutan harus melaksanakan tugas dan tanggung jawab sebaik-baiknya, sesuai dengan petunjuk dan peraturan dari SGU.

Assignor / *Pemberi Ijin:*

Dr. Maulahikmah Galinium, S.Kom., M.Sc
Dean of Faculty Engineering and Information Technology
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SWISS GERMAN UNIVERSITY

EKONID AHK German-Indonesian Chamber of Industry and Commerce

Certificate of Appreciation

This certificate is proudly awarded to

Dena Hendriana, Sc.D.

as **Trainer** in the

EUREM ENERGY MANAGEMENT TRAINING

18th March 2022 until 25th June 2022

Tangerang, 25th June 2022

SGU

Dr. rer. nat. Filiana Santoso
Rector

EKONID

Hardy Hoffmann
Head Training & Education Department

EUREM
European EnergyManager
licensed for Indonesia

Dena Hendriana, B.Sc., S.M., Sc.D

COGENERATION OF HEAT AND POWER

AGENDA

- Basic Concepts and Variants of CHP
- Cogeneration Units and Peripheral Systems
- Sizing of CHP Plants
- Feasibility and Investment
- Closing

AGENDA

- **BASIC CONCEPTS AND VARIANTS OF CHP**
- COGENERATION UNITS AND PERIPHERAL SYSTEMS
- SIZING OF CHP PLANTS
- FEASIBILITY AND INVESTMENT
- CLOSING

BASIC CONCEPTS AND VARIANTS OF CHP

A Cogeneration system is a device capable of producing electrical, mechanical and thermal energy, directly in the place in which it is installed. The term “Cogeneration" takes its origin from the fact that this system is able to combine thermal energy recovery contingent on the electric energy production.

Why the need of CHP systems

- Thermal power plants are the major source of electricity supply on earth
- Conventional power plant efficiency is 35%, thus 65% of energy is lost
- Losses of around 10-15% in transmission and distribution of electricity

Need of:

- More efficient energy production systems
- Energy supply reliability
- Decentralization of energy production systems

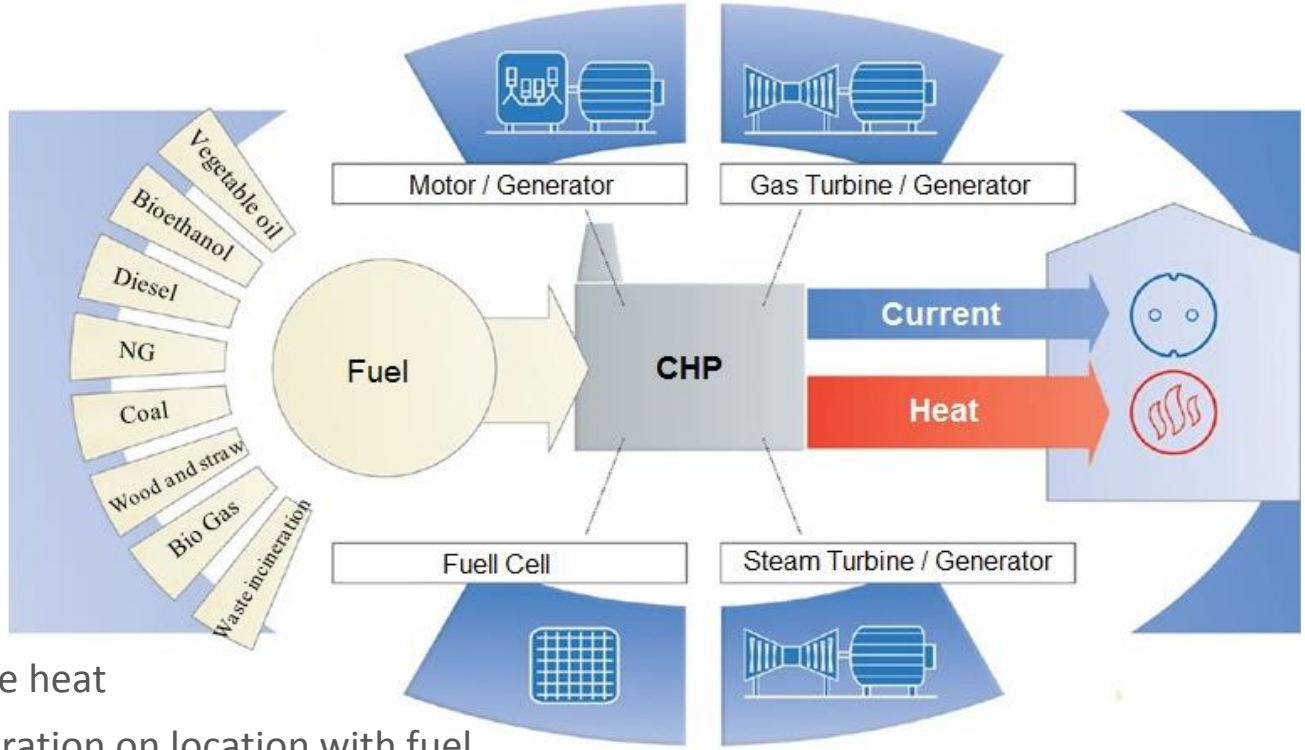
BASIC CONCEPTS AND VARIANTS OF CHP

Aim of a Cogeneration system is to self-produce electrical energy and recover heat from engine refrigerating fluids and from exhaust gases, in order to provide it to users linked to the system. In respect to a traditional installation, advantages are many, from an energetic, environmental impact and economical point of view.

Summarizing:

- CHP defined as the sequential generation of two different forms of a useful energy from a single primary energy source
- Typically mechanical energy and thermal energy:
  - ME may be used either to drive an alternator for producing electricity or rotating equipment such as motor
  - TE can be used either for direct process applications or for indirectly producing steam, hot water, hot air

BASIC CONCEPTS AND VARIANTS OF CHP



- Use of waste heat
- Power generation on location with fuel

BASIC CONCEPTS AND VARIANTS OF CHP

ADVANTAGES of CHP

- higher overall efficiency
- on site production of power and heat (supply reliability)
- reduced operating costs possible
- reduction in emissions compared to conventional electrical generators and onsite boilers

DISADVANTAGES of CHP

- heat requirement needs to match the heat production
- need of a reliable know-how
- high capital cost
- maintenance effort

EUREM-Training Content

1. Energy technical basics

- scientific Basics
- structure of energy systems and typical optimization strategies
- Measurement and Control (MCR)

2. Project management

- development of a project concept
- presentation of the project concept
- project controlling

3. Economic calculation

- calculation of the application-specific costs
- comparative economic Evaluation
- calculation of payback periods

4. Energy management | load management

- establishing an energy management system (for example, ISO 50001)

- basics of internal energy audits
- tasks of energy data management
- structure of an energy data management system
- acquisition and structuring of consumption data and costs
- consumption and cost evaluations
- comparison of indicators
- process management Systems
- reduce load peaks
- software-based energy controlling

5. Energy and emissions trading

- energy-related laws and regulations
- energy purchasing, energy trading
- emissions trading
- contracting

6. Building energy requirements | energy efficient buildings

- construction physical basics
- construct | acquisition of the building envelope
- building energy certification
- energy-conscious building and renovation

7. Heating technology

- system components
- targetperformance analysis
- optimization (furnace and boiler, distribution, control, power consumption)
- geothermal energy

8. Process heat, steam, heat recovery

- system analysis (components, functions, temperature levels, process chains)
- process optimization
- operating mode
- heat recovery

9. Cogeneration of heat and power

- basic concepts and variants of CHP
- investments (turbine types, engine types, fuel cells)
- peripheral systems
- sizing of CHP plants (technical interpretation, profitability)
- cogeneration unit (CHP)

10. Ventilation and air conditioning

- basic physical laws
- system components
- analysis (flow, temperature difference, energy consumption)
- optimization (user behavior, Operation)
- Invest-measures (refrigerating machine, absorption , adsorption, spring water cooling, adiabatic cooling, distribution, utilization of waste heat)

11. Refrigeration technology

- basic elements and functions of refrigeration Systems
- analysis (COP calculation, losses, efficiency of the process)
- optimization (user behavior, minimizing cooling requirements, process optimization, restructuring cooling network, scheme, waste heat utilization, absorption refrigerating machine)

12. Electrical engineering, electrical drives

- basic knowledge electrical applications
- transformer losses and motor losses

- electronic speed regulation
- selection of efficient electric motors
- system optimization

13. Lighting

- photometric basic parameters, lighting systems
- dimensioning of lighting systems
- operating time optimization
- highly efficient lighting systems

14. Compressed air

- compressors, distribution, compressed air consumers, plant control
- analysis (power consumption, distribution losses, leakage, efficiency)
- optimization (pressure level, control, leakage, maintenance, heat recovery, variable speed controlled compressor)

15. Solar technology

- components and operating principle of solar thermal systems
- applications of solar thermal plants (water, heating, hall heating, drying, solar cooling)
- components and functional principle of photovoltaic (PV) systems
- applications of PV systems (no external power supply, façade integration, shading elements)

16. Energy from biomass

- wood-fired plants (plant components and function, system dimensioning)
- biogas plants (plant components and function, system dimensioning)

17. Green IT

- data centers and server systems
- data center cooling
- virtualization and consolidation
- energy Efficiency at the office
- change of user behavior

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EUROPEAN ENERGYMANAGER TRAINING

The qualification of an employee as an Energy Manager (IHK) creates operational know-how in order to continuously uncover energy-related weaknesses, to use savings potential and to optimize energy efficiency. The project work achieved saves companies an average of about 30,000 euros per year in energy costs.